Before the
Federal Communications Commission

In the Matter of	)	
	)	
Healthcare Delivery Elements of	)	GN Docket Nos. 09-47, 09-51, 09-137
National Broadband Plan	)	WC Docket No. 02-60
NBP Public Notice #17	)	

Comments of
The American Telemedicine Association

The American Telemedicine Association (ATA) is pleased to provide comments regarding healthcare delivery elements of a proposed national broadband plan.

Background

American Telemedicine Association - ATA is a national non-profit association representing healthcare institutions, health professionals and the corporate world involved in providing healthcare using telecommunications. For over fifteen years, ATA has promoted the deployment of telemedicine as an integral component of modern quality healthcare.

Telemedicine – Telemedicine expands access to health services and reduces the cost of healthcare while increasing efficiency and effectiveness. The use of remote health services can significantly improve the management of chronic diseases, increase the availability of health specialists in shortage areas, shortens patient and provider travel times, and reduce hospital stays and re-admissions. Patient satisfaction with using telecommunications technologies to connect with specialists and other healthcare providers has consistently been very high.

Telemedicine (including such references as telehealth, eHealth, eCare, mHealth, connected health, etc.) involves the use of telecommunications to provide healthcare. Telemedicine is distinct from other activities involving health technology. Health IT is more focused on the development and sharing of electronic health records, information and administrative accountability systems within traditional healthcare institutions and is often championed by medical CIOs; the medical device industry focuses on the development and use of equipment to detect and treat disorders and is largely driven by manufacturers. In contrast, telemedicine focuses on delivery of care and health education and is most often championed by clinicians.

ATA Comments

The use of commercially available, public-switched networks is usually the most economical approach to provide telecommunications services for health applications. However, the lack of uniform connectivity

throughout regions and the concerns regarding the quality of service with the public IP network have kept some users away. National efforts to assure quality and connectivity must be put in place to eliminate the need for private networks and drive down the cost of delivering healthcare thus raising the demand for more broadband services.

As new alternatives for telecommunications services become available, health providers are experiencing a problem common to other professions: "if you don't know what is possible you don't know what you may need." When it comes to telecommunications services, national efforts to expand broadband availability should include a targeted effort to inform health providers of services and how these technologies can be used to improve the delivery of care.

ATA has previously provided the Commission with a number of recommendations related to healthcare delivery and broadband. These are contained in the Association's filings regarding a National Broadband Plan (GN Docket 09-51), Innovation and Investment in the Wireless Market (GN Docket 09-157 and 09-51), and Medical Body Area Network (ET Docket 08-59). In those filings, a number of recommendations were made. Some of the specific recommendations are expanded upon in this filing. Several of the broader recommendations that reflect the growing use of telemedicine are noted here:

- No distinctions regarding goals for broadband should be made based on location. A national goal must be coast-to-coast, border-to-border.
- Broadband goals should be specific to both upstream and downstream capabilities.
- The nation should adopt a national goal of 100% coverage of broadband wireless services.
- The FCC should develop an expanded plan for use of priority wireless health services.
- The FCC should allow small portions of spectrum to be set aside for specific health-related purposes, such as a medical body area network.
- The rural health program should encourage building and expanding use of existing, commercially available wireless services and integrate such services with existing landline networks, rather than constructing entirely new dedicated networks.
- The federal government should establish an interagency telemedicine committee charged with identifying opportunities for synergy, supporting uniform approaches in the delivery of telemedicine applications and coordinating services.
- Existing universal service programs such as Lifeline and Link-Up programs should be expanded to enable low income consumers to gain access to broadband, as well as basic telephone service.

In the following sections, ATA provides responses to specific questions posed in the Commission's Public Notice.

1. I.T. Infrastructure to Support Healthcare Delivery.
And
2. Connectivity Requirements to Support Health IT Applications.

Because the delivery setting and type of health application are closely intertwined, ATA will respond to both of these areas of investigation in one section. ATA's comments respond only to those questions in the Notice in which the Association has expertise.

Using telecommunications to transmit health data encompasses a wide variety of applications, providers and devices. Rapid changes are occurring in the variety and use of devices and applications. Wide

variations exist in the preferred connectivity for the same application between urban areas, rural areas, type of device used, type of image compression in use and availability and price of telecommunications services. Determining the current location, size and scope of current clinical telemedicine services within the United States is not well documented.

In this section, ATA will describe the current state of IT infrastructure in use in three settings: hospitals, long-term care facilities and homes. Included in this discussion is an overview of various applications in use at each setting and their evolution. Emergency response uses for telemedicine are highlighted in the last part of this section.

Hospital-based broadband networks

Telemedicine has traditionally been delivered through broadband, hospital-based telecommunications services. Telemedicine services can be provided either through a multi-site, multi-service network or via a point-to-point or limited site connection supporting the outsourcing of a specific specialty service.

The most common technology used in the early years of telemedicine network development was multiple ISDN lines providing two-way live video to rural sites. Where telecommunications lines were not available, telemedicine programs managed their own communication networks using point-to-point microwave, twisted copper and other technologies. Network connectivity was closed and privately managed employing proprietary technologies. Today, most hospital-based general telemedicine programs are utilizing IP-based applications. For example, a 2006 survey of telemedicine network connections in the Northwestern section of the United States revealed that approximately 70 percent use IP-based connections with typical speeds of 112KB to 384KB. Around the same time, independent medical departments, primarily radiology, started using ISDN lines to provide high-speed, one-way transmission of medical images to the homes of specialists and later to separate imaging centers. These were operated apart from any general telemedicine networked system. Recently, other departments, such as neurology, cardiology and pathology have also used broadband telecommunications to outsource or supplement staffing.

Within the last ten years many hospitals have also added high-speed broadband services using the public switched network to provide internet connectivity and to transmit financial data for payment from third-party payers. A few hospitals have started to merge the use of broadband services. However, in many institutions multiple broadband connections serving different purposes continue to be managed separately. This is a reflection of the historical growth of these services and the inherent separation between clinical departments, hospital administration and IT departments, as well as the differing requirements for transmission speeds.

The requirements for connectivity speed vary depending on the application. The highest end uses currently involve transmission of radiological images. A single image can vary from 2 MB for a simple black and white x-ray to 3 Gbits or more for a 64 slice CT scan. Speed requirements also vary depending on the type of data compression used or if video applications are included. PACs (picture archival and communications systems) operated within a hospital using a closed-system (such as ethernet) can provide speeds from 2-10 Gbits per second to handle the size and complexity of data. Sending hundreds of images to an outside reading center requires very large connections, although the speed is normally only downstream. Other applications, such as telemental health counseling, may not require the same speed but often needs two-way video with both upstream and downstream broadband capabilities.

Remote ICU services allow multiple hospitals to share specialists to care for intensive care patients. Such remote ICU centers use broadband connections to each of the participating units, often using redundant connectivity to guard against potential telecommunications outages.

Because of the requirements for very high speeds and quality of service reliability, many direct imaging and ICU services are still using high-cost, proprietary telecommunications networks. As the public-switched network increases overall bandwidth capabilities and reliability, this may change with accompanying financial savings.

New mobile applications are being used by hospitals and hospitalists to provide remote monitoring and assessments. An iPhone application by Air Strip, called OB, allows obstetricians to receive live fetal monitoring data on their cell phones. George Washington University Hospital in Washington, DC, uses an application called mVisum to transmit patient ECGs to the cell phones of emergency physicians. These applications are primarily utilized within urban areas as they require broadband wireless connections. Until broadband wireless is available for rural America, such applications will remain nothing more than an interesting idea.

Common requirements for all clinical applications are the need for guaranteed, continuous connectivity and quality of service as well as fast upstream and downstream speeds. As the number of applications increase, whether using wired or wireless connectivity in rural or urban areas, such requirements are expected to expand.

Long term care facilities

Including infrastructure requirements for long-term care facilities is intended to stress a critical point: a direct correlation exists between the need for speed in data transmission and the rules and regulations governing the delivery of healthcare.

Section 149 of the Medicare Improvements for Patients and Providers Act of 2008 added skilled nursing facilities (SNFs) to the list of eligible sites for reimbursement of health services delivered via telemedicine. For the first time, Medicare will allow payment for many different remote specialty services to residents of nursing facilities. Notably, reimbursement is still not allowed for nursing facilities in metropolitan areas or for basic primary care services for nursing home residents. So, while there is a small increase in the support for potential remote services, most services and facilities remain ineligible.

Because the medical director of a nursing home is the provider of primary care services and the gatekeeper of specialty referrals, few incentives exist to facilitate the referral of nursing home patients to specialists. Medical conditions normally handled by specialists outside of long-term care facilities are handled by the primary care physician inside of the facility. Often, the limited number of outside specialty referrals does not represent a sufficient quantity for the facility to investment in telemedicine.

Until healthcare regulations are revised to allow reimbursement for remote health services in several key areas, the adoption of telemedicine by SNFs will remain low and the demand for broadband connectivity will lag behind other healthcare settings.

Home

Probably the greatest change in the delivery of remote healthcare is occurring in the area of individual care and wellness outside of a healthcare facility. What was once confined to home telehealth is quickly changing as mobile applications are available anywhere a person is located. Instead of home-based telemedicine, a more appropriate term is remote person-based care or personal telehealth.

Ubiquitous broadband connectivity will allow many previously hospital-based or homebound patients to return to the community. Units that allow interactive monitoring or send vital sign data to a nurse or remote monitoring center, devices that wirelessly monitor implanted pacemakers and mobile phone applications that allow consumer-directed efforts to lower weight and control glucose levels are only a few of the new personal telehealth applications hitting the market.

Not all such applications require broadband. Transmitting weight, blood pressure, temperature or blood glucose levels can be accomplished efficiently over POTs. However, an increasing number of these applications are available only over broadband wireless or require transmission of images and data or live-streaming data in order to operate. For example, approximately 4 million Americans with an arrhythmia, using an implanted pacemaker or suffering from congestive heart failure use remote cardiac monitoring, transmitting simple information over a phone or cell phone. However, today 100,000 Americans also require live 24/7 monitoring of their heart and need a constant connection to the remote monitoring center.

The types and speeds of connectivity are rapidly changing and the site of connectivity is evolving from large hospitals to clinics, to places of employment or residence to the individual regardless of location.

IT Infrastructure and applications supporting the use of healthcare for emergency response

Broadband services which provide remote healthcare via telemedicine have a wide variety of potential uses for emergency response. These include accessing specialized health and medical services for affected populations, remote personal monitoring to control disease outbreaks and providing surge capacity for local health and medical providers. The use and benefits of broadband health services have been well documented, demonstrated, recommended and, under some circumstances, even required by federal agencies, Congress and independent bodies.

However, many suggestions and recommendations and requirements have been ignored. Those working in this area have become frustrated. Changes must be made by the federal government to bring the benefits of broadband health services to people in need during an emergency.

Since the Oklahoma City bombing in 1995, ATA has been exploring how remote healthcare services can be appropriately used in emergency response. Since then, much has been learned regarding the potential use and misuse of telemedicine in emergencies. Indeed, there are areas where telemedicine is not be appropriate for basic life support, firefighting and peacekeeping in the early minutes and hours of an emergency. However, ATA members have worked closely with first responders, the U.S. military and international aid agencies to successfully demonstrate how, where and when the insertion of broadband health services can play a critical role in responding to emergencies.

One example of how broadband health services can be used on a grand scale is the proposal to create a national meta-network of existing health networks. Soon after 9/11, Michael Powell, then Chairman of

the Federal Communications Commission, asked ATA's Past President, Dr. Jay Sanders, to suggest ways to better utilize telemedicine for emergency medical response. Subsequently, ATA submitted a white paper to the Chairman titled *The Telemedicine Response to Homeland Safety and Security - Developing a National Network for Rapid and Effective Response for Emergency Medical Care.* In that paper, ATA proposed that the 200 vertical telemedicine networks that exist throughout the United States connecting major hospital centers with over 3,000 outlying hospitals and clinics should be connected to form a comprehensive horizontal network. Such a national network can form a lifeline for responding to certain types of emergencies across the country. We also proposed that these existing broadband medical networks be linked with public health services to create seamless access to expertise at key national centers such as the Centers for Disease Control and National Institutes of Health for any health and medical provider or any first responder, regardless of their location.

Based on the experiences from several major emergencies and numerous interviews and discussions with experts in telecommunications and healthcare, ATA has identified a number of issues and opportunities that should be addressed. These involve enabling the use of telemedicine for emergency response by targeting telecommunications infrastructure design of healthcare institutions; national, state and local preparedness policies and the use of broadband applications:

Communications Facility Design - In many situations, the failure of the communication system in the medical facility was caused by inadequate design, including the placement of the network hubs in vulnerable locations, such as basements that area susceptible to flooding. In other cases, back up electric generators were either inappropriately located or the facility carried inadequate fuel and battery supplies to operate the generators for prolonged use in an emergency. When medical facilities review preparedness for handling disasters, an assessment should be made of the facilities' communications infrastructure and the ability of the institution to continue operations on its own during prolonged periods.

Redundancy - Similar to other problems associated with network design, the reliance on one telecommunications provider left many medical facilities vulnerable to communications failure due to destruction of facilities or the systems' inability to handle the volume of calls. In some cases, medical information executives used alternative vendors only to discover that both vendors shared, or were routed through, a common network where the problem was located. To prevent this occurrence, the use of back-up facilities and alternative routes for communication networks should be employed. Federal regulatory changes should allow critical health and medical organizations to support multiple, independent and redundant telecommunications services.

Regional and National Data Repositories - Despite the improvements in technology for the use of digitization of medical records and medical images, eighty percent of the nation's medical facilities have yet to take advantage of this new technology. Those that have, sometimes use single locations for depositing this valuable and critical information. Access to such digital information both within the facility and between facilities is important in adequately responding to disaster situations. However, the requirements for storage of such information are enormous. For example, it is estimated that up to five terabytes of information per year would be needed for large facilities. National policies, including grant programs and tax inducements, should be adopted to encourage the adoption of digital systems for all medical facilities that include multiple back-up storage of data consistent with current rules regarding patient privacy. One model to be considered is the current effort by the Veterans Administration, which is migrating to a unified repository.

Back-Up Capabilities - Current regulatory systems discourage building networks or communications facilities with excess capacity that can be used for emergencies. Regulatory or tax incentives should be considered for the development of spare or back up facilities and expanded networks both in the public switched network as well as for separate emergency networks with capacities that can accommodate peak load levels.

Intercommunication And Interoperability – Despite years of efforts, millions of dollars and countless national, state and local studies, communication networks and radio frequency assignments used by fire, police, and emergency crews are still sometimes incompatible and inhibit coordination.

First Responder Training - Training for first responders often does not take into consideration the appropriate understanding and use of broadband telecommunications systems and associated applications and how they can be used to support medical response in emergencies. First responders are rarely equipped or trained in the use of telemedicine. This should be addressed with modifications in emergency response training manuals and training exercises.

Use of Telemedicine in DMAT Teams – Changes in rules related to federally designated Disaster Medical Assistance Teams will allow expanded use of telemedicine in disaster response and incorporate the use of broadband telecommunications services to support DMAT teams. The FCC should initiate a dialogue on this issue with HHS to explore how broadband applications can be used to improve DMAT teams.

Fixing Universal Service Support – Based on suggestions by ATA within the 9/11 white paper, in 2004 the FCC opened up the rural health program to include local public health agencies. In addition, in 2006, the Commission established a pilot program to support the construction of state or regional broadband networks and services provided over those networks. However, the FCC rural health program is badly in need of an overhaul in order to make the program successful and enable effective and efficient use of the funds. (This is discussed further in comments below).

Completion of Mandated National Study and Inventory – The 2006 *Pandemic and All-Hazards Preparedness Act* directed HHS to conduct an assessment of the use of telemedicine for disaster response and develop a national inventory of such capabilities as well a plan for integrating the use of technology for disaster response. The FCC should explore ways of cooperating with HHS to meet the requirements of this legislation.

Implementing Federal Report Recommendations – Two independent federal reports involving the FCC made a number of recommendations regarding the use of telemedicine in disaster response. ATA participated in both bodies:
- *Federal Communications Commission, Independent Panel Reviewing the Impact of Hurricane Katrina on Communications Networks, 2006 - 2007*
- *Federal Joint Advisory Committee on Communications Capabilities of Emergency Medical and Public Healthcare Facilities* – This group was established pursuant to the Implementing Recommendations of the 9/11 Commission Act of 2007

Both of these reports made recommendations about the use of broadband medical and health services for use in emergency response. Few of these recommendations have been addressed.

3. Health I.T. Value Capture & Use Cases.

Over 40 years of research has yielded a wealth of data about the cost effectiveness and efficacy of many telemedicine applications. PubMed, a bibliographic database of medical research that is maintained by the National Library of Medicine, includes over 10,000 citations of published works related to telemedicine or telehealth. Over 2,000 evaluative studies related to telemedicine have been published in two journals devoted to telemedicine alone. The summaries that appear highlight the results from a few of the studies that have evaluated the cost effectiveness, quality of care and patient acceptance of telemedicine.

Cost Effectiveness of Telemedicine

Most of the peer-reviewed qualitative and large sample-size research about the cost effectiveness of telemedicine is relatively new - many emerging in the past two years. These studies are consistent in finding that telemedicine saves the patients, providers and payers money when compared with traditional approaches to providing care. Many of these studies assess the cost effectiveness of specific telemedicine applications.

The Value of Provider-to-Provider Telehealth Technologies Center for Information Technology Leadership Partners HealthCare System, Inc, 2007
This study examined several specific telemedicine applications and used a rigorous approach to define both costs and financial benefits to the nationwide implementation of each application.
- For the use of telemedicine to join EMERGENCY ROOMS - the cost to equip all US emergency departments with hybrid telehealth technologies could easily be covered by savings from a reduction in transfers between emergency departments. From a baseline of 2.2 million patients transported each year between emergency departments at a cost of $1.39 billion in transportation costs, hybrid technologies would avoid 850,000 transports with a cost savings of $537 million a year.
- For the use of telemedicine in CORRECTIONAL FACILITIES - Correctional facilities could cover their costs of hybrid telehealth equipment by savings from a reduction in transporting patients to emergency departments and to physician offices, and by avoiding the costs of the emergency department visit. From a baseline of 94,180 transports made annually from correctional facilities to emergency departments at a cost of $158 million in transportation and visit costs, hybrid technologies could avoid almost 40,000 transports with a cost savings of $60.3 million a year. Further, hybrid technologies could avoid visits to physician offices. From an annual baseline of 691,000 physician office visits at a cost of $302 million, hybrid technologies could avoid 543,000 inmate transports with a cost savings of $210 million.
- For the use of telemedicine in NURSING HOMES - the costs of implementing hybrid telehealth equipment in nursing homes could be covered by savings from a reduction in transferring residents to emergency departments and physician offices, and by avoiding the costs of the emergency department visit. From a baseline of 2.7 million transports made annually from nursing facilities to emergency departments at a cost of $3.62 billion in current transportation and emergency department visit costs, hybrid technologies could avoid 387,000 transports with a cost savings of $327 million. In addition, of the 10.1 million physician office visits made annually from nursing facilities at a cost of $1.29 billion for in-person physician office visits and transportation, hybrid technologies could avoid 6.87 million transports with a cost savings of $479 million.

Care Coordination/Home Telehealth: The Systematic Implementation of Health Informatics, Home Telehealth, and Disease Management to Support the Care of Veteran Patients with Chronic Conditions Adam Darkins, Patricia Ryan, Rita Kobb, Linda Foster, Ellen Edmonson, Bonnie Wakefield, Anne E. Lancaster *Telemedicine and e-Health. December 2008, 14(10): 1118-1126.*
The Veterans Health Administration (VHA) introduced a national home telehealth program, Care Coordination/Home Telehealth (CCHT), in 2003 to coordinate the care of veteran patients with chronic conditions and avoid their unnecessary admission to long-term institutional care. CCHT patients increased from 2,000 to 31,570 (1,500% growth) between 2003 and 2007. CCHT is now a routine noninstitutional care (NIC) service provided by VHA to support veteran patients with chronic conditions as they age. Routine analysis of data obtained for quality and performance purposes from a cohort of 17,025 CCHT patients shows the benefits of a 25% reduction in numbers of bed days of care, 19% reduction in numbers of hospital admissions, and mean satisfaction score rating of 86% after enrollment into the program. These results demonstrate a dramatic reduction in costs and an equally dramatic increase in quality.

A Systematic Review of the Key Indicators for Assessing Telehomecare Cost-Effectiveness Stephanie Vergara Rojas, Marie-Pierre Gagnon. *Telemedicine and e-Health November 1, 2008, 14(9): 896-904. doi:10.1089/tmj.2008.0009.*
This careful review identified reports on telehomecare published between 1997 and 2007. Of the identified studies, 23 were appropriate for comparison of costs in various ways. Of these, 70% were in the United States, 15 of 23 were randomized control trials, and 48% were published between 2003 and 2007. Teleconsultation was about equal to telemonitoring in the services. Total cost, cost per patient, and cost per visit were all reduced by telehomecare. The report also concluded that standardization of cost outcomes should be implemented in order to help funding agencies better understand the importance of telehomecare.

Economic Impact of eICU Implementation in an Academic Surgical ICU Benjamin A Kohl, Frank D Sites, Jacob T Gutsche, Patrick Kim, Anesthesiology and Critical Care, University of Pennsylvania, Philadelphia, PA Crit Care Med. 2007;35(12):A26.
This study shows an improvement in mortality and length of stay after implementing *e*ICU (VISICU, Baltimore, MD) in a large academic surgical ICU. The purpose of this study was to measure the economic impact of this transition. The study compared a random sample of 189 patients pre-*e*ICU to 2,622 patients 3 years post *e*ICU using a multiplier of 13.87 to normalize populations. Assumptions based upon published literature include an average surgical ICU cost per day of $1,500-$2,000 and an average daily cost on a general floor of $500-$600. There was no significant change in practice paradigm during the time period. APACHE III scores were used to calculate predicted length of stay in ICU and hospital. The study concluded that there was an almost 10% reduction in ICU stay and 20% reduction in floor stay after implementation of *e*ICU. This translated into a savings of $706,272-$941,697 for the ICU and $2,134,339-$2,842,940 for the floor.

Cost-Utility Analysis of Telemedicine and Ophthalmoscopy for Retinopathy of Prematurity Management Kevin M. Jackson, OD, MPH; Karen E. Scott, MD, MBA; Joshua Graff Zivin, PhD; David A. Bateman, MD; John T. Flynn, MD; Jeremy D. Keenan, MD, MPH; Michael F. Chiang, MD Arch Ophthalmol. 2008; 126(4):493-499.
This study evaluated the cost-effectiveness of telemedicine and standard ophthalmoscopy for retinopathy of prematurity (ROP) management. Models were developed to represent ROP examination and treatment using telemedicine and standard ophthalmoscopy. Cost-utility analysis was performed

using decision analysis, evidence-based outcome data from published literature, and present value modeling. Visual outcome data were converted to patient preference–based time trade-off utility values based on published literature. Costs of disease management were determined based on 2006 Medicare reimbursements. Costs per quality-adjusted life year gained by telemedicine and ophthalmoscopy for ROP management were compared. One-way sensitivity analysis was performed on the following variables: discount rate (0%-7%), incidence of treatment-requiring ROP (1%-20%), sensitivity and specificity of ophthalmoscopic diagnosis (75%-100%), percentage of readable telemedicine images (75%-100%), and sensitivity and specificity of telemedicine diagnosis (75%-100%). For infants with birth weight less than 1500 g using a 3% discount rate for costs and outcomes, the costs per quality-adjusted life year gained were $3193 with telemedicine and $5617 with standard ophthalmoscopy. Sensitivity analysis resulted in ranges of costs per quality-adjusted life year from $1235 to $18 898 for telemedicine and from $2171 to $27 215 for ophthalmoscopy. The study concluded that telemedicine is more cost-effective than standard ophthalmoscopy for ROP management. Both strategies are highly cost-effective compared with other healthcare interventions.

Telemedicine and Quality of Care

Studies in this area indicate that the use of telemedicine for monitoring of chronic care patients and distribution of specialty care over a large region have resulted in significantly improved outcomes. Studies show that there is no difference between telemedicine and traditional delivery systems in terms of the provider obtaining clinical information, making an accurate diagnosis and developing a treatment plan that produces the desired clinical outcomes. Here are a few examples.

Home-based telehealth: a review and meta analysis Dellifraine JL, Dansky KH. *J Telemed Telecare. 2008;14(2):62-6* Department of Health Policy and Administration, The Pennsylvania State University. The analysis consisted of a systematic review to identify studies on the effect of home telehealth on clinical care outcomes. The search was restricted to peer-reviewed publications (published between 2001 and 2007) about studies conducted in home or residential settings. The search yielded 154 potential articles and dissertations. A total of 29 articles met the inclusion criteria and were included in a meta-analysis. The weighted mean effect size for the overall meta-analysis was 0.50, and the z-statistic was 3.0, indicating that telehealth had a moderate, positive and significant effect (P < or = 0.01) on clinical outcomes. Sub-analyses also indicated positive significant effects of telehealth for some disease categories (heart disease and psychiatric conditions), but not others (diabetes), patient populations and telehealth interventions. Overall, the meta-analysis indicated that telehealth positively affects clinical outcomes of care, even in different patient populations.

Janca, 2000. Telepsychiatry: an update on technology and its implications. *Curr Op in Psych* 13: 591-7. This study/article concluded that even "early research demonstrated that the psychiatric interview conducted over videoconferencing is reliable for diagnostic assessment and treatment recommendations." In addition, a retrospective review of medical records comparing clinical outcomes of patients seen by [interactive TV] (IATV) and those in-person showed no significant difference found in the percentage of change in Global Assessment of Functioning (GAF) between the two groups suggesting clinical outcomes were not affected by the use of IATV.

Young TL, Ireson C. Effectiveness of school-based telehealthcare in urban and rural elementary schools. Pediatrics. 2003 Nov;112(5):1088-94. This study concluded that telehealth technology was effective in delivering pediatric acute care to

children in the subject schools. Pediatric providers, nurses, parents, and children reported primary care school-based telehealth as an acceptable alternative to traditional healthcare delivery systems.

Leggett PF, Graham L , Steele K, Gilliland A, Stevenson M, O'Reilly D, Wootton R, and Taggart A (Sep 2001) Telerheumatology: Diagnostic accuracy and acceptability to patient, specialist, and general practitioner. *British Journal of General Practice* 51(470) : 746-8.
This study examines the diagnostic accuracy and acceptability of telemedicine in the field of rheumatology. One hundred patients had a telephone and televisual consultation and the results were compared with a face-to-face consultation. While the telephone consultations were often unsatisfactory, the televisual consultations were highly accurate (97%) and acceptable to patients, general practitioners, and specialists.

Jerant AF, Azari R, Martinez C, Nesbitt TS.A randomized trial of telenursing to reduce hospitalization for heart failure: patient-centered outcomes and nursing indicators. *Home Healthcare Serv Q.* 2003;22(1):1-20.
Patient self-care adherence, medications, health status, and satisfaction did not significantly differ between groups. The study concluded that telenursing can reduce CHF hospitalizations and allow increased frequency of communication with patients.

Belmont JM, Mattioli LF. Accuracy of analog telephonic stethoscopy for pediatric telecardiology. *Pediatrics.* 2003 Oct;112(4):780-6
In pediatric patients, a narrow-bandwidth telephonic stethoscope can accurately distinguish between functional and organic murmurs and thus can detect heart disease. Accuracy is greatest when the instrument is used by an experienced examiner with patients at least 5 years of age.

Craig J, et. al. 2000. The cost-effectiveness of teleneurology consultations for patients admitted to hospitals without neurologists on site. *Journal of Telemedicine and Telecare* 6 (suppl 1): S1: 46-9.
This study compared outcomes of patients admitted to two small institutions. One hospital received neurological services by telehealth, the other in-person. Comparing case-mix, process of management, and outcomes for all patients using ICD-10 codes with a final diagnosis of neurological condition there were no appreciable differences noted between the clinical outcomes and the length of stay between patients receiving services in-person and those who received services via telehealth.

Telemedicine and Diabetes Dimmick et. al. *Telemed Journal and e-Health*, 9(1): 13-23 (2003)
This was a study of patients receiving care over a telemedicine network that linked three hospitals and an FQHC with six sites, a dental clinic, and patient homes. Outcomes from the disease management programs conducted over telemedicine for the diabetes group showed that the diabetes disease management program increased the number of diabetics who brought their blood sugar under control.

Patient Satisfaction with Telemedicine

Patient satisfaction with the use of telemedicine services has consistently been very high. Degrees of satisfaction may vary slightly with the specialty accessed through telemedicine, but overall patients have responded positively to its use. Patients most appreciate the ability to see a specialist, the feeling of getting personalized care from a provider who has the patient's interest in mind, and the ability to communicate with the provider in a very personal and intimate manner. Examples appear below.

Gustke, S.S., Balch, D.C., West, V.L., and Rogers, L.O. 2000. Patient satisfaction with telemedicine. *Telemedicine Journal* Spring 6(1): 5-13.
Patient satisfaction was examined in relation to patient age, gender, race, income, education, and insurance. Overall patient satisfaction was found to be 98.3%.

Janca, 2000. Telepsychiatry: an update on technology and its implications. *Curr Op in Psych* 13: 591-7.
In this study, results indicated that "most consumers found that a video link with a psychiatrist moderately or greatly helped them in managing their treatment, with 98% of the preferring to be offered videoconferencing in combination with local services."

Brodey et al, 2000. Satisfaction of forensic psychiatry patients with remote telepsychiatric evaluation. *Psych Services:* Oct 51(10): 1305-7.
This study indicated that satisfaction did not differ significantly between video and in-person consultations for incarcerated patients.

4. Health IT Use Drivers & Barriers.

The federal government is both the major driver and a major barrier to the expansion of telemedicine services.

The Federal government has been using telehealth as an effective and economical way to meet its direct healthcare responsibilities, notably to the military, veterans, Indians and prisoners. Another federal driver is as a tool for non-health goals, such as rural development and broadband deployment, most notably the FCC's Rural Healthcare Pilot Program. The federal government has also been instrumental with modest funding of telehealth development and deployment as a healthcare infrastructure, such as network grant programs from Office for the Advancement of Telehealth in the HHS Health Resources and Services Administration.

However, the Federal government has been a barrier due to the restrictive coverage and reimbursement for telehealth in Federally-funded health benefit programs, notably Medicare, Medicaid, SCHIP, the Federal Employee Health Benefits Program, and TRICARE. Another barrier results from the federal governments fragmented telemedicine policy, federal funding, regulations, and other activities remain uncoordinated, inconsistent, and outdated.

In particular, the Federal government's commitment to telehealth via grants and other temporary, short-term funding is not sustained by ongoing reimbursement for remote health services. For example, the FCC funds the Rural Healthcare Pilot Program up to $400 million per year, but Medicare spent less than $1.5 million for telehealth services in 2006 (the most recent year for detailed data). From another perspective, Medicare spent only 0.0004% for telehealth out of its $373.8 billion spending in 2006.

To streamline Federal policy for telehealth we urge the FCC to:
- Propose a high-level Administration mechanism for coordinating telehealth development, deployment, coverage, and reimbursement
- Set as a priority for Federal reimbursement Federally-funded health facilities, notably HHS-funded community health centers and Indian Health Services facilities.

- Urge the removal of geographic and other non-medical barriers to Federal coverage and reimbursement.

The following describes some the geographic and other barriers to Medicare telehealth coverage and reimbursement:

- No telehealth for metropolitan beneficiaries -- A big restriction in Medicare's coverage of telehealth is the lack of coverage for metropolitan areas – where 79% of Medicare's beneficiaries live. Current law states that a beneficiary must be served at a site located "in a county that is not included in a Metropolitan Statistical Area." This is the most restrictive of several definitions of "rural" used by the Federal government. Many metropolitan counties have large areas that are rural by any other common measure (Grand Canyon National Park, for example, is considered urban under this definition). Also, many metropolitan counties are small in population – about 500 have less than 75,000 people. Every state has at least one SMSA (Standard Metropolitan Statistical Area); New Jersey, Rhode Island and the District of Columbia are totally in one or more SMSAs. In the U.S., there are 363 SMSAs, encompassing 1092 counties, ranging in population from Carson City, Nevada SMSA with about 55,000 on up.

- Many metropolitan beneficiaries face major barriers to getting necessary health services. Provider shortages and transportation challenges exist in many SMSAs.

- No "store and forward" in "lower 48" -- A major way of delivering healthcare by telecommunications technologies involves storing patient information at one medical site and forwarding it to another medical site for consultation with a specialist or other medical purpose. Medicare law restricts "store and forward" to "any Federal telemedicine demonstration program conducted in Alaska or Hawaii."

- Restricted to selective Medicare providers -- Medicare law bars some providers from delivering telehealth services -- even as they are otherwise permitted in Medicare. Notably, physical therapists, occupational therapists and speech-language pathologists are prohibited from delivering telehealth services.

- Restricted to selective "originating sites" -- Medicare does not pay for some medical sites, such as hospices and non-hospital kidney dialysis facilities, for originating a telehealth service.

- Restricted to selective medical procedures (CPT/HCPCS codes) -- CMS allows only certain specific services to be delivered by interactive video or other telehealth methods. Unfortunately, CMS rejected ATA's request for inclusion of certain physician visits of nursing home patients by telehealth.

- No reimbursement for remote monitoring equipment or provider time – This is a problem for beneficiaries with one or more chronic conditions, especially those at-risk for hospitalization.

There are multiple barriers to the growth of telemedicine. What is amazing is that telemedicine has grown so rapidly despite these barriers. However, to reach its full potential, policy barriers to telemedicine must be removed. The primary issues involving federal policy include:

Medicare Coverage for Telemedicine

1. Remove Medicare Barriers – Inequities in reimbursement coverage for telemedicine delay the adoption of cost-saving and quality-improvement measures and restrict consumer access and choice in many high-need areas. Congress should extend Medicare reimbursement for remote medical and health services for--
    *   All Medicare beneficiaries -- Medicare's coverage is only for the 21% of beneficiaries, who live in a county outside of a metropolitan area.
    *   All remaining institutions eligible to participate in Medicare but not currently eligible for telehealth reimbursement such as renal dialysis facilities
    *   All remaining medical services currently covered under the CPT procedure codes but not eligible to be reimbursed when provided via telemedicine/telehealth
    *   Medical services that are provided using store-and-forward technology, such as wound management, screening for diabetic retinopathy, and dermatology
    *   All healthcare providers whose services are eligible for Medicare reimbursement, such as physical therapists, occupational therapists and speech-language pathologists
    *   Telemedicine practitioners who are credentialed by a Joint Commission hospital or other accredited facility should be considered in compliance with Medicare condition of participation and reimbursement credentialing requirements for telemedicine services. This should apply if 1) the acceptance is pursuant to the standards of the Joint Commission applicable to telehealth and remote interpretive services, and 2) the credentialing and privileging of the practitioner by the distant facility providing the telehealth service is in compliance with Joint Commission hospital standards applicable to medical staff.

2. Encourage Remote Monitoring, Home Telehealth and Remote Disease Management Services -- Home telehealth and remote disease management services are proven to yield cost savings and improve care in homebound and chronic disease patients and are valued services for patients. However, these services are not currently eligible for reimbursement under Medicare. Congress and CMS should encourage the use of home telehealth as a recognized and reimbursable component in the provision of home care and should provide reimbursement for the costs of deploying devices and related technology. Patients should not be required to come into the doctor's office for routine, scheduled health monitoring appointments in cases where such services can easily and efficiently be provided in the patient's home. Medicare should change its reimbursement rules to allow existing patients to have vital signs monitored remotely instead of traveling to the provider's office. Such services will add no federal expenditures and will significantly reduce costs for hospitalizations and emergency department visits and should not be limited to a 60 day episode of care.

Telemedicine in National Health Reform

The Administration and Congress are committed to enacting a comprehensive national reform plan. Such reform should take advantage of the efficiencies, increased effectiveness and expanded access available via telemedicine. The lack of reimbursement for remote health services by Medicare has been a major impediment to the growth of telemedicine. It represents a backward approach to the delivery of care and flies in the face of actions taken by states, employers and private payers across the country.

About 10 states have adopted legislation requiring that if an insurer covers a service delivered through traditional means then it shall also be covered when delivered by a telehealth method. ATA supports such a standard for health service plans under a national program.

Reauthorize the Telecommunications Reform Act

The existing rural healthcare program should be expanded to provide broadband services to all physicians and healthcare offices.

1. Expand Support for Universal Services -- All carriers of telecommunications services, regardless of mode of delivery, should contribute to the Federal Universal Service Fund. In addition, entities currently receiving funds should be grandfathered in so that they do not become ineligible to receive funds.

2. Streamline and Expand the Rural Health Program – The current rural health program should be reworked to simplify the application and administrative process. One approach is the use of deep, across-the-board discounts for broadband services to eligible healthcare institutions. In addition, the program should support the deployment of wireless networks within all eligible health facilities as a cost-effective approach to expand access to broadband services to the desktop of each physician and nurse. Any such changes should protect the support being provided to current approved facilities.

3. Encourage Interconnections of Remote Healthcare Networks – Federal support of network bridging between and among the 200 telemedicine networks that exist in the United States will serve as an important component in expanding healthcare services, improving medical education and collaboration, and will function as a foundation for the development of reach-back networks that can be accessed for emergency response as well as regional training and preparedness.

Promote Health Information Technology Programs and their Coordination with Telemedicine

Legislation that provides financial support for increased utilization of information services and technologies by healthcare institutions, especially the development and implementation of system-wide electronic records, must continue to be introduced and realized.

The development of interoperability between different health or medical record systems, as well as between medical devices, is critical to the expansion of telemedicine. Networks already established for the delivery of remote healthcare should be used to facilitate the development of regional technology applications. Piggybacking on already-established networks for providing clinical care, as well as using already-established secure, high bandwidth networks for other health technology applications, is both efficacious and efficient.

ATA will continue to play a leadership role with other appropriate entities promoting health information technology.

Resolve Legal Barriers to Telemedicine

Existing federal and state laws can impede the growth of telemedicine and deny consumers and the healthcare industry access to its benefits.

1. State Physician Licensure - Congress and the administration should work with the nation's governors and state legislatures through such groups as the National Governors Association (NGA), National Conference of State Legislatures (NCSL) and Federation of State Medical Boards (FSMB) to craft an interstate agreement that will:
    *   Encourage medical licensure cooperation among states;
    *   Facilitate the exchange of information regarding investigations and adverse actions among states;
    *   Promote compliance with laws governing the practice of medicine in each state; and
    *   Invest states with the authority to hold physicians accountable for meeting all state practice laws.

    To facilitate the development and adoption of such an interstate agreement, the Secretary should develop financial assistance to encourage the development of the accord and financial and regulatory incentives that would be made available for each state that adopts the agreement.

2. Nursing Interstate Compacts - The efforts of the National Association of State Boards of Nursing to implement a nationwide set of mutual recognition laws within an interstate compact for the practice of nursing using telemedicine should be supported.

3. Internet Practice Issues –
    *   Email consultations between patient and physician should be reimbursed;
    *   No federal or state laws should prohibit the ability of telemedicine programs to provide prescription drugs to patients;
    *   Evaluation of critical issues related to the availability of prescription drugs over the Internet including licensure laws, clinical practice deficits, and consumer demand should be supported.

4. Malpractice Coverage - State requirements to mandate payments for telemedicine service should be accompanied with requirements that insurance carriers provide malpractice coverage for those same services.

5. Offsite Contracting - U.S. medical institutions should have the right to contract with other organizations to provide medical services via telemedicine as long as appropriate provisions are included to
    *   ensure that only qualified licensed personnel are used in providing the services,
    *   provide for ongoing quality assurance requirements within the contractual arrangement, and
    *   assure that all patient confidentiality provisions are equally enforced by both the primary medical institution and the contractor.

Support Federal Programs and Initiatives that Advance the Deployment of Telemedicine Technology and Services

The advancement of programs and technologies that improve patient outcomes, add efficiency to health systems and help alleviate disparity in healthcare can be accomplished by leveraging appropriate public resources supporting telemedicine. The federal government continues to provide important financial and technical support for the development of telemedicine networks through a variety of research, grant and support programs. Research conducted by the National Institutes of Health and Department

of Defense has provided the seed for many breakthroughs in technology and applications. Grants administered by the Departments of Health and Human Services and Agriculture have supported many state and local initiatives now helping thousands of Americans. Full funding for such programs is vital as the nation's healthcare system copes with a crisis of cost and quality. In addition, the Departments of Defense and Veterans Affairs should take full advantage of the benefits and efficiencies telemedicine has to offer in their work to care for those injured in the wars in Iraq and Afghanistan. The Indian Health Service, as well, should fully utilize telemedicine in meeting the needs of the population it serves.

5. Data Security in Health IT.

A critical priority for all health information is maintaining the privacy of patients. Federal HIPPA laws have identified goals for patient privacy and much work has been done to identify successful approaches to ensure privacy, such as the use of data encryption and the elimination of patient identifiers for certain file transmissions. Maintaining patient privacy is an important goal and is relatively straight forward for most telemedicine services. For example, any use of the public switched network for transmitting health information should use data encryption.

Similar challenges have been faced by the financial industry and have been overcome; it is telling that remote debit transactions are available throughout the world and used by a large majority of Americans daily without fear of compromised information. Learning from the experience of the financial industry may be a useful pathway to overcome concerns related to privacy.

6. Universal Service Rural Healthcare Support Mechanism and Rural Healthcare Pilot Program.

Within the past year, ATA has asked the Commission to make a number of changes in the Rural Health Program and the Rural Health Pilot Program. The discussion below lays out some of the primary issues about the rural health and pilot programs associated with the use of broadband services and ATA's recommendations.

Universal service rural health program

The overall design of the core universal service program for rural health must be changed.

- Health provider access to services, including new "on demand" broadband services from alternative carriers, should be included. All communications providers should be eligible to participate in the health program.

- The program should be refocused on assuring all healthcare facilities have access to broadband and the ability to communicate with each other, regardless of location. The rural-urban disparity for line rates for broadband services is disappearing with transition away from ISDN and privately managed networks to the use of the public switched network. However, the need for broadband-based health telecommunications remains. The FCC should replace current discounts in rural rates with an across-the-board discount and extend the benefit to all health providers, regardless of location.

Rural healthcare pilot program

The development of regional network grids, extending through firewalls and different network architectures, to link neighboring telemedicine networks will facilitate a "best practice" model for healthcare delivery. This is the core of the current rural health pilot program and is a critical component in the national objective of building a healthcare information infrastructure. It is also a central component in many proposed approaches to the use of telecommunications for disaster response. The support of such regional network grids, using any available broadband network or technology, should be permanently incorporated into the rural health program.

The premise of the pilot program, encouraging interconnection of networks into a grid, has not been realized due to the overall design of the program. Approved projects are not uniform in their approach. Some avoid existing telemedicine networks. Others interconnect with facilities that already have broadband connections.

In addition, numerous problems have been identified with the administrative implementation of the pilot program. The problems are largely due to the poor initial design including the initial review process, program rules and regulations. While subsequent rulings by the Commission have helped to resolve some of the largest problems, a review and change in the program structure is needed. In the meantime, a series of issues with approved projects remain.
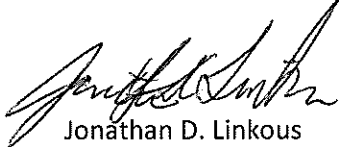
- ISSUE: Of the 69 projects that were initially approved by the FCC, there appears to be a wide variation among applicants in terms of cost per site and the involvement and participation of health providers in the design and implementation of the program.
  RECOMMENDATION: An immediate re-evaluation of the project applications should be made taking under consideration the issues addressed above and those projects found to be wanting requested to address outstanding issues. This review should be accelerated and take no longer than one month so that the projects with sound designs can move forward immediately.

- ISSUE: Prolonged delays in gaining final approval of projects have seriously threatened the success of the program. About 2½ years after announcing the program, few projects have received final approval. Guidance from FCC and USAC staff appears to be arbitrary, conflicting and changing.
  RECOMMENDATION: An accelerated effort should be made to release the funds for all projects after completing the brief evaluation process outlined above.

- ISSUE: Despite the complexity of many of the projects, no money was allowed to be allocated for project management, with the exception of direct funding for creation of a network design RFP. At this point most applicants have invested thousands of dollars in preparing for the project without any final approval in sight and with no support for administration once the project is approved.
  RECOMMENDATION: The use of federal dollars to support project administration and project management costs needs to be allowed. Allowable expenditures need to include salaries, travel to program facilities/sites, and other expenses of a recurring nature.

- ISSUE: Detailed quarterly progress reports have been required of all 69 selected participants starting in 2007 even while they await final approval and funding to start their project. RECOMMENDATION: Quarterly progress reports should not be required of selected participants until funding is actually dispensed and the project has started.

- ISSUE: The FCC has ruled that recipients of the pilot program funds can resell excess capacity of their network to others. This is not allowed under the normal rural health program. This, essentially, allows health providers to compete against commercial broadband providers.
RECOMMENDATION: FCC policy should be uniform among all aspects of the rural health program.

- ISSUE: Approved applicants for the to the pilot program have been informed that they are now required to complete a sustainability plan, which must be reviewed and approved prior to the issuing of a final funding commitment letter. ATA is very supportive of requiring program sustainability for any federally funded telemedicine project. However, such a requirement should have been incorporated into the original application guidelines provided for the pilot program. Requiring applicants to retroactively develop such a plan and to subject it to a rigorous review process, apparently with benchmark requirements, appears to be unjust to those project applicants that have already received initial approval and have already waited over two years for funding to commence.
RECOMMENDATION: The FCC and USAC should continue to require a sustainability plan and provide ongoing technical assistance to grantees with sustainability issues but should NOT hold up funding while the projects are putting together the plans.

- ISSUE: The current severe economic decline and the considerable delay in providing a final funding letter have left many project applicants desperate to gain immediate access to the 15% cash match required for their project to proceed. The cash match is on top of the requirement that no funds can be used to support administrative services for the projects.
RECOMMENDATION: There is not legislative requirement for a cash match. The match is not even a requirement of the regular rural health program. The Commission should set aside the match requirement or, at minimum, adopt a more liberal position in accepting in-kind services including administrative services.

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